SEALED SOURCE
PROCESS KNOWLEDGE EVALUATION FORM

PKE Number _____

Section I: To be completed by generator

General Information: (If more than two, attach spreadsheet)

1. Description and dimensions of sealed source (e.g. electroplated Am-241 source, Ra-226 source encapsulated in resin, 1/4"): _____

2. Present location of source: (Bldg/Room) _____

3. LLNL ID number(s) _____ ❒ Not Applicable

Radiological Characterization: ***There must be information available to support the below information. All determinations must be reproducible.***

4. Radionuclides present in the waste and the activity for each nuclide:

Radionuclide	Activity of Source(Ci)	Activity when shielded (if shielded)	Weight
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

❒ See attached sheet

5. Determination of radionuclides:

❒ Process Knowledge: Explain: (Example: Inventory Controls) _____

❒ Radioanalysis (attach results) ❒ Radiological swipe (attach results)

❒ Gamma Spectroscopy ❒ Alpha Spectroscopy

6. Determination of Activity: ***Documentation must be attached describing all calculations and assumptions used to obtain the activity values.***

❒ Gamma Spectroscopy ❒ Alpha Spectroscopy

❒ Mass Balance ❒ Mass to Curie Conversion

❒ High Sensitivity Neutron Instrument ❒ Tritium Off Gas Measurement

❒ Material Managements Spreadsheet ❒ Other (explain) _____

List procedure(s) followed: _____

7. Source verification documentation for each source: (Must have 2 of the following)

❒ Materials Management sealed source inventory printout

❒ Copy of the NIST Certification for the source

❒ Photographs of the sealed source(s)

❒ A memo describing how the identity of the source was determined and verified.

8. Are the sources shielded? ❒ Yes ❒ No, ❒ some are (list which sources are shielded)

a. Is the source lead shielded? ❒ Yes ❒ No

b. What is the shielding material? _____

9. Is the source leaking? ❒ Yes ❒ No, If yes, explain additional packaging requirements.

SEALED SOURCE
PROCESS KNOWLEDGE EVALUATION FORM

PKE Number _____

Waste Evaluation:

10. Does the waste contain any of the following:

Verified by: *VI=Visual Inspection; S&A=Sampling and Analysis; PK=Process Knowledge,* ***When PK is checked, it must be supported by Visual Inspection (VI) or an explanation must be documented. (Example: Inventory controls, none used in process, or reference supporting documentation, if not already described above, (e.g., logbooks, drawings).***

a. Grease / oil ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

b. Hazardous residues ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____
If yes, what are the residues _____

c. Entrapped Liquids ❒ Yes ❒ No ❒ VI ❒ PK _____
If yes, is it less than 0.5% by volume of the waste? ❒ Yes ❒ No
What is the liquid? _____

d. Particulates [> 1% by weight of < 10-micrometer diameter (flour) or > 15% by weight of < 200-micrometer diameter (sand)] ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

e. Compressed gases ❒ Yes ❒ No ❒ VI ❒ PK _____

f. Etiological agents ❒ Yes ❒ No ❒ S&A ❒ PK _____

g. Chelating agents ❒ Yes ❒ No ❒ S&A ❒ PK _____
If yes, is the concentration less than 1% by weight? ❒ Yes ❒ No

h. PCBs (capacitors, etc.) ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

i. Explosives ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

j. Pyrophorics ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

k. Asbestos ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____
If yes, is it ❒ friable ❒ non-friable. If friable, please segregate.

When Sampling and Analysis is used, attach results.

Supporting Information

11. Operational use of the source(s): _____

12. Historical locations of source(s): _____

13. Year source(s) were purchased: _____

14. Was the source designed and fabricated on-site? ❒ Yes ❒ No
If yes, describe any documents (e.g. specifications, engineering notes) available for material traceability:
_____
_____

15. Manufacture's Specifications / Information Available? ❒ Yes ❒ No
If yes, list specification information and location _____
_____

16. List Procurement Documentation (e.g. purchase requisition, statement of work), if applicable: _____
_____

Generator (please print) _____ extension _____

Signature _____ Date _____

Section II. HWM REVIEW AND VALIDATION

1. The waste matches the description above. ❒ Yes ❒ No
2. The serial number matches the serial number on the sources. ❒ Yes ❒ No ❒ NA
3. Section I is complete. ❒ Yes ❒ No

_____

Completed by: Print Signature Date

SEALED SOURCE
PROCESS KNOWLEDGE EVALUATION FORM

Section III. ENVIRONMENTAL ANALYST REVIEW

When the generator is using process knowledge to characterize his waste the EA should review the supporting documentation. If no documentation is reviewed, explain why, (e.g., visually examined the waste, documented any interviews with the generator).

1. Based on the information provided on this PKE Form, the waste is free of regulated hazardous materials. ❒ Yes ❒ No
2. List the documentation that was reviewed to support the characterization of this waste stream.

_____

_____

❒ See attached list of additional support documentation that was reviewed.

❒ Waste characterization memo attached.

❒ No documentation was reviewed: Explain why: _____

_____

_____

EA Print Signature Date

Section IV. HEALTH PHYSICIST REVIEW

1. Based on the information provided on this PKE Form, the waste has been properly characterized as to its radiological content. ❒ Yes ❒ No

   ❒ See attached memo for additional information.
2. The anticipated range of error associated with the method described in Section I, 8 is _____.
3. Method is reproducible. ❒ Yes ❒ No Method is representative. ❒ Yes ❒ No

_____

HP Print Signature Date

Section V. WASTE CERTIFICATION ENGINEER REVIEW

Radiological Characterization:

1. The radionuclides described above are identified on the Waste Stream Characterization Data Sheet and are within the ranges listed. ❒ Yes ❒ NA (Waste is not destined for NTS)
2. The radionuclides described above are performance assessment critical isotopes. ❒ Yes ❒ No ❒ NA
   ❒ NVO PA ❒ Hanford PA ❒ Envirocare
3. Are there decay chain isotopes that require reporting? ❒ Yes ❒ No
   If yes, list the Reportable Isotopes. _____

   _____
4. Does the waste contain fissile material? ❒ Yes ❒ No

   If yes, are there criticality safety requirements? ❒ Yes ❒ No

   If yes, please attach safety requirements.
5. Are the quantity and type of radionuclides present sufficient to generate nuclear heating? ❒ Yes ❒ No
   If yes, list expected wattage. _____

_____

WCE Print Signature Date

SEALED SOURCE
PROCESS KNOWLEDGE EVALUATION FORM

PKE Number _____

WASTE CERTIFICATION ENGINEER REVIEW continued

General Review:

1. Sections I, II, III, and IV have been completed by qualified personnel.
2. ❒ The above sections are properly completed.
3. ❒ The above sections illustrate that the waste is acceptable.
   ❒ The above sections indicate that the waste may not be acceptable for shipment to the NTS.
   ❒ The waste was segregated and identified for further evaluation.
   Upon further evaluation, the waste was found to be:
   ❒ acceptable, and can be packaged for shipment to NTS.
   ❒ unacceptable, and shall remain segregated.
4. NCAR Issued, ❒ Yes ❒ No NCAR Number _____
5. Surveillance conducted: ❒ Yes Surveillance Number: _____
6 Critical equipment being utilized to process waste is as follows: (e.g. scales, torque wrenches)

_____

❒ See attached list Critical equipment has been entered into the database. _____ Initials

_____
WCE Print Signature Date

Section VI. WASTE CERTIFICATION OFFICIAL REVIEW

1. I have reviewed the information on this form and certify that the subject waste is not mixed waste and meets the requirements of NVO-325 (current version). ❒ NA (Waste is not destined for NTS)
2. The waste is acceptable to be packaged for shipment to ❒ NTS ❒ Hanford ❒ Envirocare.

_____
WCO Print Signature Date

Section VII. COMPLIANCE REQUIREMENTS

Packaging:

Waste will be packaged in accordance with:

❒ Packaging Instructions Number: _____

❒ Facility Specific Handling and Packaging Procedure.

Procedure: _____

Training:

Required Training. EP0006 and ❒ EP0110 or ❒ OJT

Training records are on file for the generator. ❒ Yes ❒ No,

If no, the generator was given OJT. ❒ Yes Initials _____

Waste Characterization Summary:

The appropriate Waste Characterization Summary Form has been updated in accordance with WCP-15.

❒ Yes Initials _____

_____
WCE Print Signature Date